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OF

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VOLUME VI.

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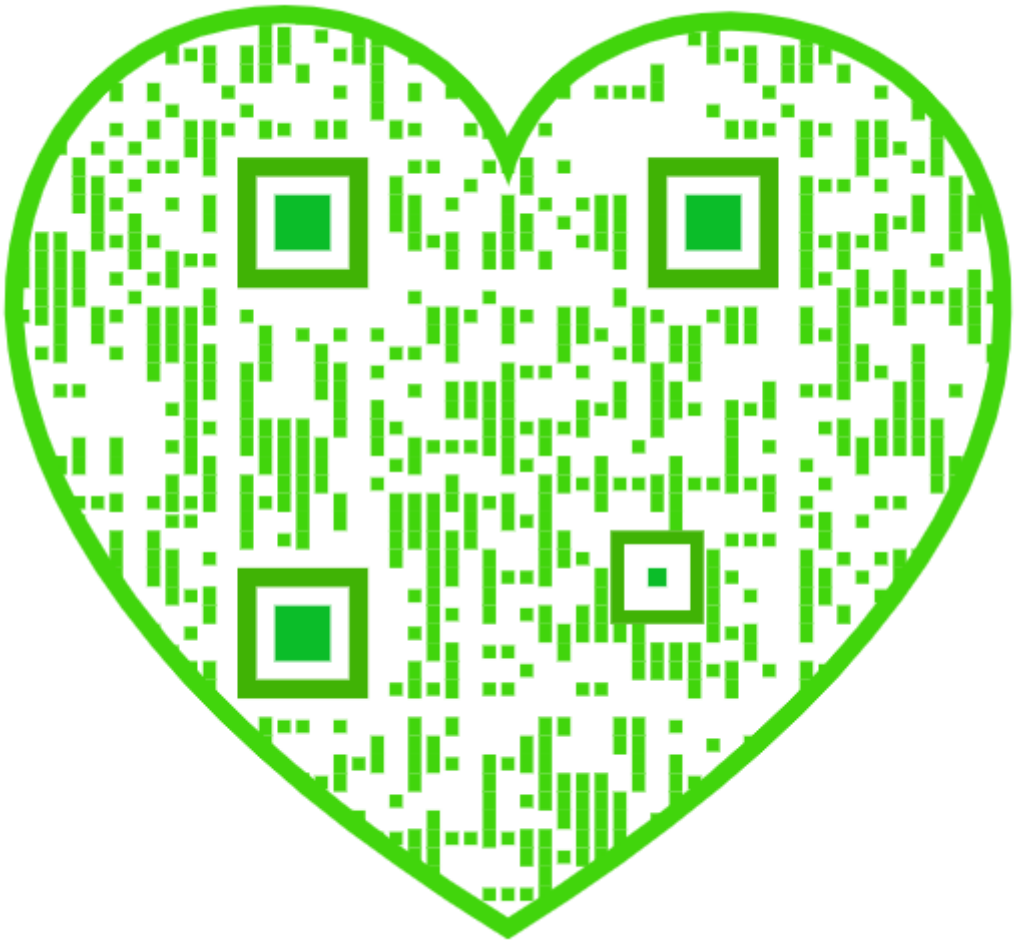

Scientific American.

THE ADVOCATE OF INDUSTRY, AND JOURNAL OF SCIENTIFIC, MECHANICAL AND OTHER IMPROVEMENTS.

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Rail-Road News.

Aurora Branch Railroad.

GENTLEMEN—In your very valuable "Scientific American," under the heading of "Railroad News," I have seen no notice of our "Aurora Branch Railroad," which we, in this section, consider a very important link in the great chain of Western thoroughfare. This road intersects the Chicago and Galena Union Railroad at Junction, a point thirty miles west from Chicago, running thence in a southerly direction down the beautiful valley of Fox River to Aurora, a town of considerable note in Kane Co. I understand a company is already formed to extend the road to Ottawa, the head of steamboat navigation on the Illinois river, thus forming a pleasant, cheap and expeditious route from the South and West to the Eastern markets, via Chicago and the lakes. The extension will probably be completed in the course of the coming season. The Aurora Branch Railroad is already in full operation as far as Batavia, a village on Fox River, six miles from Junction and progressing day by day to its completion. A. T. P.

Batavia, Ill., Sept. 9, 1850.

Eight Wheel Cars for Railroads.

No other cars but those having eight wheels should be used on railroads. With our long cars it is impossible to insure any safety with only four wheels, when running at a high speed; for if an axle breaks, there is certain destruction, as happened on the Western Railroad near Washington Summit. The forward axle of the second passenger train broke, when going at the rate of 26 miles per hour, and the car came down on the track, tearing it along for 300 yards: Col. Mountford, of New York, a young lady named Miss Rosele, of Albany, and Mr. Whittemore, of Leicester, Mass., were killed, and some others were severely wounded. The scene was a terrible one, for the car was crowded, and the bodies of the killed were mangled and mixed up with the wreck of the car, in a most horrible manner. On an eight wheeled car there is but a bare possibility of two axles breaking at one end. No other cars, we say again, should be employed on our railroads.

English Engine Drivers.

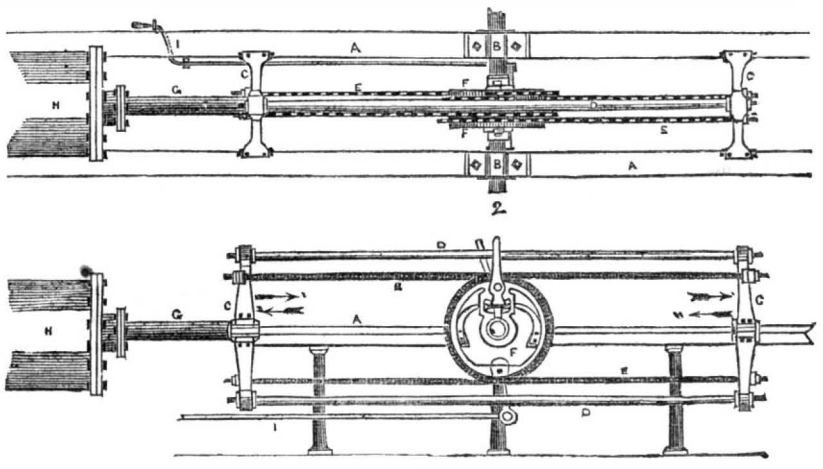
A quarrel has taken place on the Eastern Counties Line, in England between the locomotive car drivers and J. V. Gooch, the superintendant. The drivers have all quit owing to the severe regulations instituted by Mr. Gooch. It seems that he is a tartar of the real snapping turtle breed. He makes the drivers pay for broken axles, wheels and every thing for which he should pay himself.

The Celestials in China.

San Francisco probably has a population of one thousand Chinese, and this population is the most orderly, industrious and prudent of any class in the city. You never catch any of the long queues in any of the haunts of dissipation, and, per consequence, none of them on the police books. They are generally pretty good mechanics; some of them keep restaraunts, and a few trade in nick-nacks and curiosities.

A bill has passed the U. S. Senate, requiring the steamships employed as Mail vessels to Havre, to be adapted for war vessels.

THE PULLEY ENGINE.---Fig. 1.



We here present a description and engravings of the Pulley Engine, invented by Peter Yates, Esq., of Milwaukie, Wisconsin. This invention was secured to him bypatent granted on the 23rd day of last April. This is the invention which has caused no little controversy—a controversy with which the majority of our readers are somewhat acquainted. We now present the description, and state some facts about it, leaving them to speak for themselves, without any coloring from us.

Figure 1 is a view looking down upon the pulley arrangement. Figure 2 is a side view of the same. Figure 3 is an enlarged side view of the pulley and catches; and figure 4 is an enlarged top view of the two pulleys on the wheel shaft. The object of this invention is to produce a continuous rotary motion from the reciprocating motion of the piston, without a crank, by two pulleys, arranged and operated on the wheel shaft, as follows:—A A are side frames; B B are the wheel shaft bearing boxes. The side frames are fitted to receive slide boxes, the ends of which go through the cross-heads, C C. These are united by two connecting bars, D D, the one above, and the other below, forming a sliding frame. H is the cylinder of a steam engine, and G is the piston rod connected to the first cross-head C. F F are two pulleys on the wheel shaft, J, (letter turned); E E are flat link chains—there are two pair of them—as shown in figure 4; they are attached by screw rods, at both ends, to the cross-heads, as shown in figure 2, and by the other ends, V, to the circumference of the pulleys, and they are so jointed and arranged that when the frame moves backwards and forwards by the action of the piston rod, one

Figure 3.

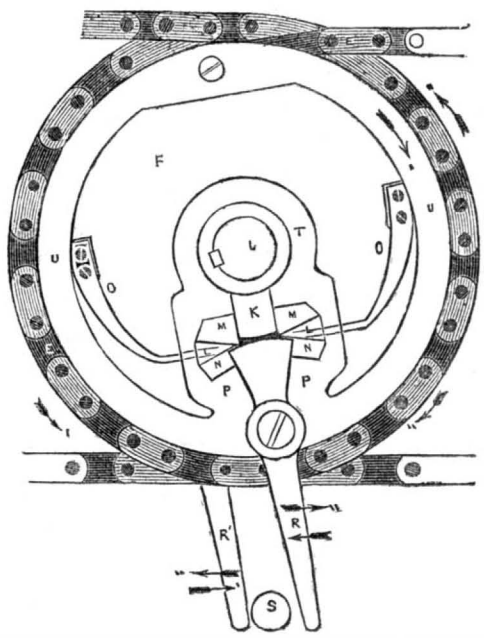
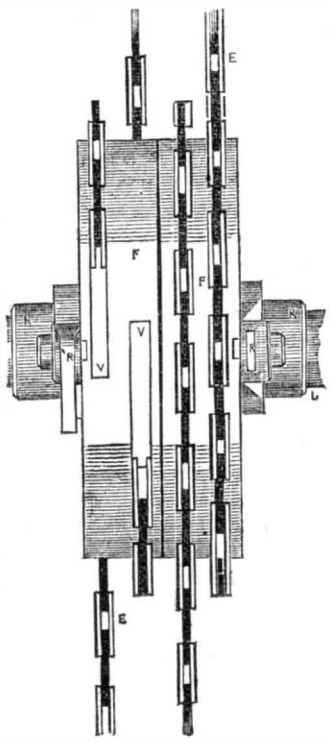


Figure 4.



chain draws off each pulley, and the other pair of chains wind on the pulleys in the opposite direction, as shown by the arrows in fig. 3.

The two pulleys, F F, are formed alike, set the reverse of one another, and have a hollow countersunk space between the boss, T, (fig. 3) which surrounds and moves freely on the wheel shaft. The rim, U, forms a solid circumference to the pulleys, and receives the last joints, V V, of the chains, E, to unite the pulleys to the cross-heads. P P are masses of metal cast on the pulleys, and are mortised to receive a pair of catch blocks, L L; one part of each block is bevelled from the outside inwardly and upwardly, as at M M, on the lower outside, and on the upper and inside edge, a similar counter bevel is cut outwardly and upwardly, as at N N. The inner and higher edges of the bevels, M, take the points of the crank arms, K, which are made with a boss surrounding the main shaft, on which they are keyed, so that the crank arms stand on the shaft in exactly the same direction. R R are two levers with screw nut fulcrums; the points of these are expanded to cover a little more than the space between the catch blocks, the under edges on each side being slightly chamfered to fit and pass on to the bevels, N N, of the catch blocks, L L. Within the recesses on the pulleys a spring, O, is secured, the point of which enters a side slot in the bosses, and passes by a ball point into the catch blocks, L, and allows the blocks to be depressed by the levers, R R, and throws them out when the lever ceases to act on the blocks. S is a bar which is sustained by vertical arms; this bar lies cross-wise beneath the pulleys, and governs the motions of the levers, R R, and causes them to lock the catch blocks, L, with, or unlock them from, the crank arms, K K (one on each side.) I is an adjustable side rod to move and adjust the bar, S; this rod has notches in its front end (not seen) which hook over pins and give either a direct or reversed motion to the levers, R, changing their action on the catch blocks to reverse the motion of the crank arm and shaft. In fig. 2 the cross-heads are moving to the right, and the upper chain, E, is drawing the pulley and parts attached in the direction of the right hand, and the left hand catch block, L, in contact with the left side of the crank arm, K, is carrying the crank and shaft, J, to the right. At this time the opposite lever, R, is canted in the contrary direction, and overlies and has depressed the right hand catch block on the opposite pulley, F, on the shaft, so that the catch block is depressed below the contact with the point of the crank arm, K, (on the opposite side from fig. 2) and the lower chain, E, on the right hand cross-head, C, is carrying the opposite pulley with the opposite lever, R, in the opposite direction to the nigh pulley, and the lower chain, E, on the right hand cross-head, is winding off the pulley, F, and the two chains on the left hand cross-head are both winding on their respective pulleys. When the movement is nearly completed in the right hand direction, the two levers, R R, will be one on each side of the governing bar, S. The contact of the levers on the said bar reverse the position of the levers and catch blocks, as the frame finishes that movement, placing the nigh lever over the catch block, L, depressing it out of contact with the crank arm, K, on that side which the crank arm, in continuing its motion, has to pass over, thus placing the opposite lever, (R, fig. 2,) between the catch blocks on its pulley, and leaving the spring, O, on its side, to throw up the catch block at the side of the opposite crank arm, at the instant the sliding frame commences to move to the left. The lower chain, E, on the left cross-head, C, then takes the draft on the opposite pulley (F, fig. 2) and carries it in the direction of the arrows to the right, which is the same direction that the nigh pulley, F, travelled, as has been described, thus maintaining the same continuous rotary motion of the wheel shaft.

The catches, levers, and springs, with the governing bar, are constructed and arranged so as to catch and let go the respective pulleys, to turn the shaft always in the same direction by the chains, when the sliding frame is moving backwards and forwards. This is the principle of the invention so far as it relates to the continuous rotary motion given to the shaft, by the reciprocating motion of the piston.

We have seen two boats constructed exactly alike, with paddle wheels of the same size—one having a crank and the other pulleys constructed like the above, and the pulley boat beatthe crank, and carried one-third less steam.

Mr. Haswell, the Engineer-in-Chief U. S. N., has witnessed the experiments, and so have some of our most eminent engineers, who, like ourselves, could not mathematically see any loss by the crank. We have all, however, seen the Pulley Boat beat the Crank Boat, as stated. We make "an honest fair confession, and scorn to equivocate."

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Miscellaneous.

American Association for the Advancement of Science.

ASTRONOMY.

Professor Joseph Henry submitted some observations on the origin, measurement, and classification of mechanical power. He said all the changes going on in the subject of the earth are produced by what we call power. All the actions going on around us we can refer to mechanical power, and mechanical power may be inferred to spiritual power. To make a distinction between power and force—force is more generic. Power is that which produces motion, which produces permanent changes in matter. When a body is in a state of power, it can pass from that state to a state of no power. If he (Professor Henry) threw an ivory ball against a ball of putty, the putty ball would be indented, and then the whole power is used in making that indention. The learned professor then referred to the different forces and velocity of cannon balls, and their power. God has so constructed the universe that each part of it acts upon other parts. If the sun were annihilated, the planet Neptune would instantly move in a straight line. Mr. Henry continued, at some length, to observe upon mechanical power; the power of water when agitated; the power of the voice, &c. He designated water power, tide power, wind, and sun beams, primary powers; and steam as a second class power. All animals derive their power from vegetable matter. We must admit that there is a space around our earth which is filled with ethereal matter, that is, something that exists between us and the sun. Light and heat require eight minutes to come from the sun to us. The question may be asked, where does the sun receive its light and heat? It is constantly giving off its power to the air; so we must suppose that exhaustion of the sun is constantly going on. The sun is a great mass of lighted matter. Now, if it is in a state of condensation, there must come a time when the sun will cease to exist. "The time will come when the sun itself will fail, and ancient night involve a desolate abyss."

TIDES IN THE GULF OF MEXICO.

Prof. Bache, President of the Association, stated that the tides of the Gulf of Mexico presented interesting peculiarities; they were generally, not universally, single day tides. Those at Cat Island were the type of this class.

The tides at the entrance of Mobile Bay were in part reduced, and new observations making there, and at other points in the Gulf. By the kindness of Col. Albert, Major Bache, Lieut. Maury, and others, access had been given to observations on record by officers of the army and navy. The observations were made hourly, day and night, for a year, and very faithfully, by Messrs. Windeman and Bassett, under direction of Lieut. C. P. Patterson, of the navy. The average rise and fall is but one foot. There is one high and one low water as a rule, in the twenty-four hours. The wind is supposed by navigators generally to cause these tides, but the hypothesis, when carefully examined, falls to the ground.

Such tides had been observed elsewhere.

The time of high water advances as the lunar day gains on the solar, until suddenly it shifts nine, ten and twelve hours. The low waters follow the same law. The times of change are at, or near the period when the moon crosses the equator. This points to the diurnal inequality, as shown by Mr. Whewell, as the source of the phenomena.

An establishment useful to the navigator may be obtained by considering the luni-tidal intervals for the superior and inferior transits, according to the moon's place, north or south of the equator. Ordinary modes of discussion fail entirely.

The curves of hourly observation for the year, leave no doubt that the declination changes of the moon are those first to be looked to. Ordinary double, or six hour tides, occured always at and near the period of no declination, when they were near the quadratures. The tables for the whole year showed this, and the comparison of tides at the zero and maximum of declination showed that the time of the occurrence (epoch) corresponded, very nearly, at a mean with the moons position.

The explanation of the tides was to be found in the interference of the semi-diurnal and of the diurnal tide waves.

MECHANICAL POWER.

The following are the views of Professor W. B. Rogers upon the different measures of mechanical power. He referred to the writings of the late Professor Robinson, of Edinburgh, who, as he believed, had first set in a clear and philosophical light the origin of the difference, and had shown that, properly understood, the two measures are entirely coincident. Prof. R. then proceeded to explain the views which, in accordance with Prof. Robinson's exposition, he has long been accustomed to maintain and teach. He illustrated the difference between two modes of measuring power, by the example of an arrow, shot vertically upwards, and a cannon ball discharged against a mass of homogeneous wax or wood. The arrow when discharged with double velocity, will ascend to a quadruple height, and a cannon ball shot with a double velocity against a mass of homogeneous wax or wood will penetrate to a quadruple depth. In both cases it is to be considered that the mass, moving with a double velocity, will require the resistance to be continued for a double time, in order that it may be brought to rest. Hence, having a double velocity, and a double time of motion, the space described must be quadruple. Thus, in both cases the work done, that is, the product of the mass into the space described, varies as the square of the velocity.

ELECTRO MAGNETISM AS A MOTIVE POWER.

Dr. Page came forward and explained by experiment his Electro Magnetic Engine. Prof. Page then drew a diagram of the fly-wheel of his engine, and a loaded friction-brake, pressing upon the circumference of the fly-wheel. The brake was loaded to 620 lbs. The power required to barely keep the engine in motion under this load was 126 lbs. The full power being on, the engine made eighty revolutions per minute under this load. The circumference of the wheel being about fourteen feet, it was easy for any one to compute the horse power from these data. He was willing to call it four horse power.

Prof. Pierce, of Harvard University, rose and said that this mode of measuring the power was entirely correct, and the best that could have been adopted by Dr. Page for the purpose. It was better than raising a weight, as it enabled him to work his engine for several hours under the load, and thereby ascertain the cost. It was the mode most commonly practised for measuring the power of engines He felt astonishment and great delight at the results obtained by Dr. Page. It was truly a great result to raise 300 lbs. of iron by magnetism through such a distance, and keep it in such rapid motion.

Prof. Henry said he had witnessed with great interest Dr. Page's experiments before the Smithsonian Institution, and was much delighted with the ingenuity exhibited in overcoming difficulties heretofore existing. Dr. Page had produced by far the most powerful electro-magnetic engine ever made within his knowledge.

WATER AS A SOLVENT.

Prof. Rodgers read a paper on the solvent powers of water. He remarked upon the fundamental importance of the investigation to the great questions of chemical geology and agriculture. Hitherto, it has, for the most part, been taken for granted that the water which penetrates through the soil and the interstices of rocks, is capable of slowly dissolving these materials. The actual proof of the solvent power, by laboratory experiments, and the mode in which it breaks down the cohesion of mineral masses, by attacking the lime, magnesia, protoxide of iron, soda and potash, had never, except in one or two instances, been distinctly shown. Prof. R. then enumerated a list of simple minerals and rocky masses which had been the subject of experiment with pure water and water impregnated with carb. acid. These included many varieties of felspar, mica, hornblende, serpentine, epidote, zeolites, &c., as well as granites, traps, lavas and other rocks. Each of these, in fine powder, gave, by the interporacious method of the tache, unequivocal proof of the solvent action of the carbonated water, and many of them were distinctly acted on by pure water. All minerals containing lime, magnesia, protoxide of iron, potash, soda, or lithia, were found subject to this decomposing action. Many of them, when in larger quantity, digested in the liquid, yielded a sufficient amount of solid matter to the solvent water, to admit of a quantitative determination.

AMMONIA IN THE ATMOSPHERE.

Prof. Hosford read an able paper on the amount of ammonia contained in the atmosphere, of which the following is an abstract:—The nitrogen in plants is supposed to be derived from this source—the subject is therefore an important one. The difficulty has been that the source did not seem to be sufficient: the amount of ammonia found in the atmosphere has been too small. The determination of Graeger gave for one million of grammes of air 0·323 grammes of ammonia. That of Kemp for an equal volume, 3·68 of ammonia. Fresenius found in an equal volume by day, 0·098, and by night, 0·169 of ammonia. The method pursued by Graeger and Fresenius was the same. With the aid of an aspirator they transmitted large volumes of atmospheric air through diluted hydrochloric acid, intended to retain the ammonia. The question arises, whether the atmospheric air transmitted is entirely deprived of its ammonia. Probably not, inasmuch as only the exterior portions of each bubble are exposed to the action of the acid. An apparatus was contrived, by which all the atmospheric air transmitted was thoroughly mingled with muriatic acid vapors. This being done, the usual method of evaporation with bichloride of platinum was resorted to for the determination of the quantity of ammonia.

THE PHENOMENA OF FERMENTATION.

Mr. Erni of Yale College, read a paper on the phenomena of fermentation. Notwithstanding the numerous essays on this subject, we know very little of the cause of fermentation; no theory yet presented accounts for all the facts now known. By the action of what is called the ferment, organic complex bodies, such as sugar, &c., are doubtless decomposed into simpler substances.

Liebig attributed the phenomena to the power of the ferment, as a body in a state of chemical action, to induce a similar transformation of compounds in contact with it. Others assert that fungi produce this effect and the varieties of fermentation are owing to various fungi. Brendecke made a multitude of experiments, according to which, porous substances, as potato-starch, straw, alum, feathers, flour of sulphur, and even small fragments of tin, and some other metals, promote fermentation in a solution of grape-sugar, mixed with some tartrate of ammonia. Some inferred from this, that yeast might also produce the same effect by its porosity, rather than its vital force. Mr. Erni repeated some of Brendecke's experiments. Rousseau made a statement, that yeast would induce fermentation even in the presence of vegetable or mineral poisons, if rendered acid, when mixed with the sugar solution. Mr. Erni did not confirm this position. His investigations led him to believe, that alcoholic fermentation is caused by the development of fungi. Whenever he detected fermentation he remarked yeast cells, on the first evolution of carbonic acid; but which is prior, is not so certain. He rather thought the yeast-cells were according to the experiments of Mitscherlich. Helmholze has remarked that two portions of grape-juice being placed in a vessel closed by a bladder, and the whole introduced into the fermenting liquid, no fermentation is communicated from one to the other. These facts, and the experiments as to the action of poison upon yeast, it is difficult otherwise to explain, even on Liebig's theory.

OPTICS.

Prof. Snell of Amherst, exhibited and described an instrument intended to illustrate the vibrations of a molecule of common or unpolarized light. In common light, the vibrations are not, like those of sound, in the line of progress, nor are they, like sea waves, perpendicularly across the line of progress, in a fixed direction, but they are across, in all directions. The instrument presented this changing direction of the vibration. A small ball of ivory, in front of a black surface, is made to fly back and forth with great rapidity, while the line of its motion gradually advances round the circle, somewhat like the hand of a clock. The mechanism which produced this motion is merely a toothed wheel, gearing into the interior of a toothed circle of about twice its diameter. If the revolving wheel has just half as many teeth as the larger wheel, the ball, as is well known, would describe a straight line, or ellipse, in one fixed direction; but if a single tooth be added to the wheel, the line, or the axis of the ellipse, will slowly make progress round the circle, and in this way the ball is made to produce the kind of oscillation proper to represent light.

Prof. S. also exhibited another article of his invention, by which the lecturer can enable his audience all at once to try the experiment of complimentary colors in vision. The apparatus consists of two discs, a foot or more in diameter, and perforated by three openings, and the other behind it, painted with alternate white and colored sectors. While the hinder disc is so situated as to show the colors through the apertures, the spectators look at a fixed point on the front disc till the eyes are a little weary, when the operator suddenly removes the colors, and renders the whole surface white, but instead of appearing white, the three apertures are seemingly occupied by a dilute tint of the complimentary color.

THE VOLCANOES OF CENTRAL AMERICA.

Mr. Squires read a long and able paper on the volcanoes of Central America. We wish we could give it in full. It was long and interesting. It will no doubt be published in full by Monroe & Co., Boston. Mr. Squire and Dr. Livingston came very near paying for their thirst of knowledge, by being covered with lava in their ascent to one of the burning mountains.

LITERARY NOTICES.

Southern Literary Messenger: Edited by John R. Thompson, Richmond, Va.—For the first time during our association with the press, we have been favored by the Editor with a copy of this sterling magazine—September number. We have often been highly pleased with extracts from this work, and judging from these only, we have been led to entertain a high opinion of its ability and character. We are not disappointed in our estimate, if the present number may be taken as a standard upon which we are to base an opinion. The contents are entirely original, and afford a feast of intellectual reason not found in the generality of monthly publications which abound so extensively in the United States. The sentiment of the Messenger is Southern in its tendency, and marked with a high sense of true patriotism, which subserves not the interest of class or party, but seeks to disseminate a more enlarged recognition of the true principles upon which this government is based. The tone is healthy, and can be profitably read throughout every portion of the country, with a pleasure and satisfaction rarely met with, especially to those who prefer something besides the trashy compound of light romance, which is read to a much greater extent by the young men of our country than redounds either to its or their good. The Messenger is issued in monthly numbers, averaging 64 pages each, at $5 per annum. It has reached its 16th volume. Dewitt & Davenport are agents for this city.

Dictionary of Mechanics and Engine Work—Number 16 of this work, published by D. Appleton & Co., Edited by Oliver Byrne, contains some excellent things. We see the excellent smelting furnace of Barron & Brothers, which appeared in our columns, well illustrated; Gas Machinery is also well illustrated, and there is a very good engraving and description of Robinson & Lee's Scotch Baking Machinery, which first appeared in the Illustrated London News.

Shakspeare's Dramatic Works, Phillips, Sampson, & Co., publishers, Boston.—This superb edition of the writings of Shakspeare is progressing very rapidly, and with remarkable uniformity of style. No. 23, is now ready, it contains the second part of King Henry VI., with an elegant portrait of Queen Margaret. Dewitt & Davenport have the numbers for sale at 25 cents each.

The same publishers have also sent us "Kosato," by J. H. Robinson; and the "Soldier's Daughter," by Col. Maxwell—price 12 1-2 cents each.

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For the Scientific American.

The Voltaic Battery.

NUMBER I.

For the invention of the Voltaic Battery we are indebted to the profound researches of Professor Volta of Italy. Volta left his invention in two forms known as the chain of cups and the voltaic pile. In these, experimental philosophy first became acquainted with the lightning in harness. The world was delighted with the invention, and the study of voltaism was eagerly pursued. The whole electrical science rose to the first importance; a host of philosophical toys were introduced for showing the new science: the ignition of wires, the decomposition of chemicals, the development of magnetism and the passage of the electric current through miles of wire, and joined hands, were gazed on with admiration, both by the deep read literati and the untutored peasant. Here was the giant in swadling clothes—the infantile Hercules at his sports; and now we see the labors of this modern Hercules commenced: the astounding telegraph, the enormous magnet, the wonderful electrotype, and the subtle purification of the metals, have first staggered our credulity, and afterwards left us prepared to believe almost anything. And what other labors may not this hidden power perform for us? Almost every day brings some new application; and more than once it has threatened to extinguish the blast furnace, close up the coal pit, and supplant the iron horse with fiery bowels.

The chain of cups, as formed by Volta, was competent to the performance of every thing to which the battery is now applied, but this instrument was destined to a sad reverse. A host of philosophers eager for fame began to make improvements on it, and soon they had so cramped, bound, and altered it, that the best forms were extremely uncertain in their action, and would maintain it only for a few minutes in succession. The want of a better apparatus was universally felt, and much lamented. For the most part it was sought to remedy the defective action by an increase of size, and the lecturing chemist sometimes used a battery as big, almost, as the wall of the room, to perform an experiment which can now be done with a battery contained in a square foot. The battery at length came to be regarded as an intolerable pest, and the thought of putting it to use in the arts would have been scoffed at. Here all progress in voltaism would most probably have ceased, had not the renowned M. Faraday applied himself to study the chemistry of the battery; he showed that it did not derive its power from a piece of copper *looked* at by a piece of zinc, but from the fluid of the battery giving one of its elements to the zinc, and that there must be some effective means of getting rid, at the same time, of the remaining element, which had been in combination with the one united to the zinc.

Here the amalgamation of the zinc plate was introduced by Mr. Kemp; this was the only real improvement yet made on the battery, and two excellent batteries, based on the views of Faraday, and with amalgamated zincs, made their appearance: Prof. Daniel's, in which the hydrogen is removed by surrounding the copper with a solution of sulphate; and Prof. Grove's, in which the hydrogen is removed by platinum immersed in nitric acid.

Next in order came the experiments of Mr. Smee; this gentleman showed that the hydrogen could be effectively removed by roughening the plate; and the chain of cups of Volta, with the zincs amalgamated by Mr. Kemp, and the silvers, roughened by Smee, is once more "The Voltaic Battery."

Having now taken a glance at the history of the Battery, let us view the instrument:—

The Voltaic Battery may be defined as an apparatus consisting of a compound fluid body, and two other bodies, one of which is so organized that it shall eliminate one element of the compound fluid; and the other body so constituted that it thall eliminate the other element; and the two bodies being connected in a certain way. To elucidate this definition, let us perform a primary experiment, as follows:—Take a vessel of muriatic acid, which is a compound, consisting essentially of chlorine and hydrogen; let a piece of silver, with a platinum wire attached, be immersed in one side of the vessel, and a piece of pure zinc, with a platinum wire attached, in the other side, taking care that the two metals do not touch in this state, else the acid will not attack the zinc, for it may remain in it for a long time without weighing less than at the beginning. But now let the two wires be brought in contact, a torrent of hydrogen will immediately rise from the silver, and so continue while the wires are in contact but cease the instant they are separated. After this action of the silver has continued for some time, if we weigh the zinc we shall find it much less than before: proving that while the silver was eliminating the hydrogen from the acid, the zinc was at the same time quietly eliminating the chlorine by combining with it. And the vessel instead of containing muriatic acid alone as at first, will also contain chloride of zinc.

Now this phenomena has evidently not been due to either of the metals and the acid, but the whole apparatus possesses the capacity of manifesting some power or force, which has the remarkable property of separating a compound fluid body into its component elements. And this property is not divided among its different parts, but resides as a whole in every particular part—in the wire as well as in the metals and acid; for let us now dip the wires in a vessel of fused chloride of silver, the hydrogen will rise from the silver as before, but at the same time chlorine will rise from one wire dipped in the chloride of silver, and a crust of silver will be formed round the other.

In the last experiment there has been the appearance as though the wires conveyed the decomposing power to the chloride of silver, and hence the wires from a battery are called the conductors; and electricians generally consider that their only office is to conduct the influence of the battery to the substance to be operated on.

Again, let us repeat the experiment, but on a conductor of copper from the silver plate this time; everything will go on as before, but instead of the chlorine being evolved from the wire, it will combine with the copper, forming chloride of copper. Let us take away the chloride of silver, and substitute a vessel of sulphate of copper: metallic copper will be formed round one wire, and sulphuric acid will combine with the metal of the other. And if we use cyanide of silver, cyanogen will attack one wire and silver will be deposited on the other. Here we may observe that it is always the wire from the same metal of the battery on which the metallic deposit takes place, and what is very remarkable, it is the wire from the zinc or metal which is dissolved, on which the deposit of metal is formed; and the wire from the silver is dissolved, while the silver itself is untouched. And if we consider the conductors merely as continuations of the battery plates, we see that if a conductor eliminates one element of a compound at one end, the other element will be eliminated at the other end; and if one end shows the sign of accretion, the other will show the sign of dissipation. As a proper conception of this is of great importance, let us illustrate it by experiment:—Arrange a number of cups in a row and let the wires from the battery dip in the end cups, then connect all the cups together by bent wires, then fill the cups with a solution of sulphate of copper; as soon as there is a continuous chain of metal between the liquid of each cup, the battery will commence action, and we shall see that the ends of all the wires toward the zinc are eaten away, and the ends of the same wires toward the silver have become enlarged by a deposition of copper on them. This is what is called the polarity of the battery, and is a constant attendant of all its various actions, and causes it to produce south polar magnetism one way and north polar magnetism the other way: one way heat and the other way cold. The proper understanding of this polarity in the use of the battery, is of the utmost importance to the electro metallurgist, for it is the location of different properties in the different ends of the conductors, and the operater has constantly to bear in mind, that if he wishes to prevent an article from being dissolved, he must attach it to that part of the battery which is being dissolved. And if he wishes to dissolve a metal he must attach it to that metal of the battery which is not dissolved.

Writers on the battery have generally elucidated this matter by naming the zinc and silver plates—positive and negatives plates; and the wires leading from them, positive and negative poles. This would be very convenient for use if possessed of uniformity, though the words positive and negative are not expressive of anything but fancies. But, unfortunately, what one philosopher calls the positive plate, another says is the negative; and a very great confusion exists about positive and negative poles.

We have now examined the battery as to its general principles, and will next proceed to the different kinds of batteries. But, first, we will recapitulate the matter above thus:—A battery to be effective must have two bodies which do eliminate the two elements from the exciting fluid; and, every conducting line is possessed of different properties at its different ends.

All who use the battery should constantly bear in mind these two general definitions.

VOLTA.

For the Scientific American.

About Explosions.--Practical Experience.

Many of the notions respecting the cause of explosions of steam boilers have not been satisfactory to my mind, and it appears to me that some of the laws of steam have been overlooked while other rules, by which it is governed, are yet unknown. I was, however, much interested with the article on page 357 of Vol. 5, of your paper; but to avoid being too tedious, I will simply rehearse what I conceive to be some of the laws by which steam is governed. Steam is ordinarily generated by the combined agency of atmospheric air and caloric. The surface of water exposed to the atmosphere is converted into the elastic state under all temperatures; even snow and ice are wasted more or less by evaporation, and it is evident that the air in water will produce the same effect under its surface, when heated to what is called the boiling point, but which varies according to the pressure on the water, —boiling quicker on a high mountain than by the sea shore. Here I would inquire, whether we may not conclude that, under a high pressure of steam, a still higher degree of heat is required? It appears so to me. Now I am well satisfied, from the result of repeated experiments, that a quantity of atmospheric air, being much heavier than steam, occupies the surface of the water in the boiler, and is not all easily displaced from that position. And I have also ascertained that steam, commingled with air, is a much slower conductor of its heat, than that contained in the upper region of the boiler; for a portion of the former (which may be designated by calling it atmospheric steam) will pass up through water some distance with the air and fly off, bearing with it, by its lightness, minute spheres of water; while pure steam will condense instantly on coming in contact with water.

In view of these facts, it is reasonable to conclude that water, under an excessive pressure, may be excessively heated, and that, owing to the non-conducting property of atmospheric steam on its surface, the more pure steam above, under certain circumstances, may also acquire an unusual degree of heat. Should it so happen, while in this state, that nearly pure steam should be brought in contact with the water, by a removal from some part of the water's surface of the atmospheric steam, a sudden equilibrium of heat would be the consequence, and a large quantity of water instantly assume the gaseous state. A slight relief of pressure by a few strokes of the piston would cause a more rapid boiling; and this, as well as some other things, might produce sueh an agitation of the water as to remove, in some part, the safety layer of atmospheric steam, and give a connection between the water and the more pure steam.

It is self-evident that pure water, free from atmospheric air, will generate nothing but pure steam, and, owing to the above stated property of pure steam, it cannot be generated by degrees, because the moment one particle of the water is heated sufficient to take the elastic form, it is all equally ready, for pure steam and water cannot remain in contact. The old saying is, "It is a poor rule that will not work both ways."

I have noticed two or three other peculiarities respecting water, air, and steam, which I have not so exactly determined; one of them I will give and offer a conjecture respecting it. I have observed open boilers or kettles of water, when heated very moderately, to emit, seemingly at least, more air, or more numerous and larger bubbles, than when rapidly heated. Now when water is thrown on highly heated iron, is it not probable that the air of the water, not having time to escape, forms an intervening layer of atmospheric steam, and prevents a rapid process of steam generation; and may it not account for the moistened hand being plunged into the liquid metal without injury?

Now we may learn how we are indebted to the influence of atmospheric air for a gradual raising of steam power, and with safety. A great and all-wise Creator saw fit in the beginning to make justsuch a firmament as should, by its action, "divide the waters which were under the firmament from those which were above;" and we may conjecture that the science of evaporation, or the atmospheric generation of steam, opens a vast field for the exploration of man, and one which he has, as yet, scarcely begun to penetrate. A. C.

A Female Aeronaut.

Mrs. Graham, with three of her daughters and her son, ascended from Bayswater, in England, a short time since, in a new balloon, called the Victoria and Albert. The party descended safely in Richmond Park. Mrs. Graham has written as follows to one of the papers: "I cannot omit noticing the extraordinary admiration of my daughter Alice, who accompanied me on Friday night from Vauxhall Gardens, at the astonishing view of London at midnight, being the first and only attempt made by females to conduct the management of a ballon at night; and so much pleased am I with the nerve exhibited by those of my daughters who have hitherto accompanied me, (four in number,) that if, on trial, I find the others of equal spirit, which I doubt not, I feel disposed, (God willing) to ascend with my seven daughters at the great national exhibition of 1851."

[Thus those who have the good fortune to attend the Great Fair, will have the pleasure of seeing Mrs. Graham and her seven daughters mount their aerial car.

A Machine for Praying.

Some tribes of Tartars, use a machine called a Mani for making their prayers. It is a neat little machine made of wood, or iron, or copper cylinders—filled with a long, but narrow roll of paper or cloth, on which their idols and symbols are painted, and, below, prayers, either printed or written in the Thibetian character—about two inches in diameter and three inches long. It moves on points like a horizontal wheel, and in a small string is a kind of iron or brass frame attached to the wheel to make it swing nicely. Not only the Buddhist clergy, but also any of the laity who feel inclined to do so, use this wheel. Those who are too poor, buy at least the prayers without the wheel, and carry the roll of paper on which they are written, or printed from a wood block, on their chest, sewn in a rag. A part of the Lamas procure their subsistence from writing or printing these prayers or sacred sentences. In Upper Kanawa they have very big Manis in their temples, which one man turns round by a handle. The people have such Manis or prayer-wheels built even in small streams close to their houses, so that the water, by turning the wheel, performs the necessary prayers for them.

Black Lead Mines of New Brunswick.

The company owning the black lead mine recently discovered near St. John, (N. B.) are working it with great success. The average yield per day is 40 bbls.

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New Inventions.

Noiseless Carriage Wheels and Horse Shoes.

The London Mining Journal states that a Mr. Andrew Smith has made a great improvement in a principle applied to the construction of wheels and horse shoes, which consists in forming the hoop ortyre of two separate layers of galvanized iron, which are riveted together, and re-galvanized in the mass; this division of parts cutting off all vibration when travelling over the roughest stones. Mr. Andrew Smith has also applied the principle to springs, in which each plate is galvanized separately, and can never rust. The axle is also made to fit the axle box with perfect exactness, by a lining of fusible metal, is itself lubricating, and not liable to heat; the whole, in conjunction, secures a degree of quiet, ease and safety hitherto unattained.

He also applies it to horse shoes, by making the shoes in two thicknesses of galvanized metal, then riveting them together, and re-galvanizing. A horse equipped in these pumps, trots over the granite streets of London as softly as if he was on a bowling green.

A New Watch.

A great improvement in the manufacture of watches has just been made in Geneva, by which watch keys are rendered unnecessary. By simply turning a screw in the handle, the watch is wound up, and another movement regulates the hands. The first watch manufactured with this improvement, is intended for America, and its case is said to be a rich and curious specimen of art, and historically interesting, the ornamented border containing a view of the famous "Charter Oak," of Connecticut. "It is a good action thus to make a watch case teem with historic associations without destroying its ornamental beauty."

Improved Carpet Loom.

Messrs. Soott & Tannahell, of Philadelphia, have made an improvement on Looms for weaving ingrain carpets, which is designed to turn off a great deal more work in the same space of time, than the common loom, and for which they have taken measures to secure a patent. The improvement consists in attaching the two trap boards together by straps passing over rollers, so that one trap board and one heddle is always going up when the other is coming down; this allows one treadle to counterbalance the other, and therefore facilitates the more rapid working of the loom, consequently more carpets can be woven with it in a given time than by the common arrangement for working the trap board.

Wine Making.

Gather the grapes when very ripe; pick off the unsound and unripe berries. The bunches are then mashed in a mashing tub, or pressed through a small mill, breaking the skin but not the seed, and thrown into the press, and the screw applied until the skins are pressed dry.

Fermentation is very simple. The juice is put into clean casks, in a cool cellar, and the casks filled within about four or five inches of the bung, and the bung put on loosely. The gas escapes, but the wine does not run over. In from two to four weeks, generally, the fermentation ceases, and the wine clears; then fill up the casks and tighten the bungs. In February or March, rack off into clean casks. In the spring, a moderate fermentation will again take place; after that, the wine refines itself, and is ready for bottleing or barreling. Use no brandy or sugar, if the grapes are sound and well ripened. Keep bunged up or corked tight, and in a cool cellar, and the wine will improve by age for many years.

Centrifugal Castings.

A company has been formed in Baltimore for casting pipes upon the principle invented and patented by Mr. Thos. Lovegrove, of Baltimore, which is done by centrifugal motion, which throws the fluid metal in successive layers, outwardly, to form the articles desired.

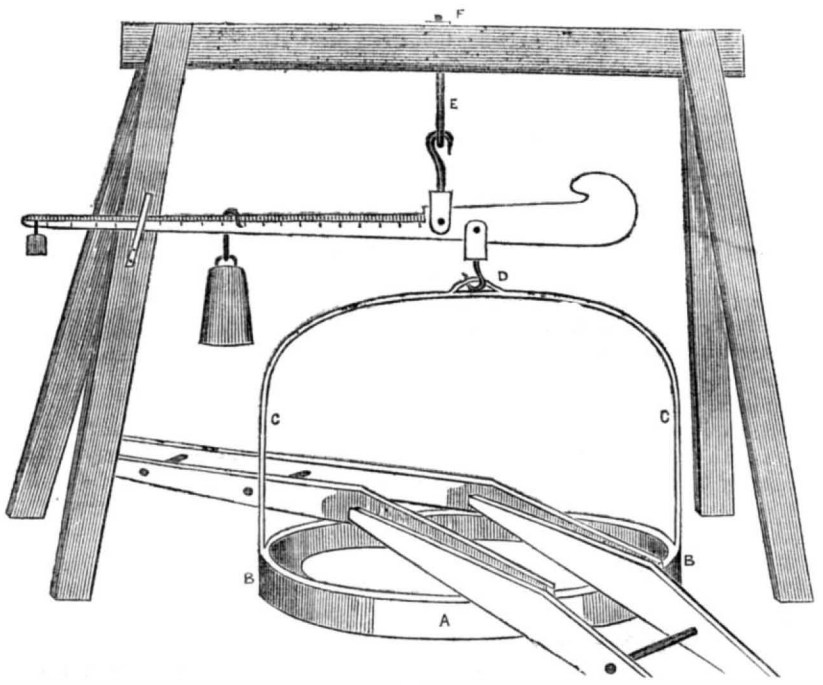
Improved Mitre Box.

Mr. A.W. Plattenburg, of Cincinnati, O., has made an improvement on Mitre Boxes, for which he has taken measures to secure a patent, and which is designed to save the wooden slits in the box, by having vertical slides on both sides, with metal guide bars on them, through which the same passes, and which descend regularly, as the saw passes down through the plank or board to be sawn. This arrangement makes the box very permanent and durable.

Improved Axle Box.

Mr. W. H. Hovey, of Hartford, Conn., has made a valuable improvement to his oil-saving axle box, which was recently patented. He places a conical plate on the outside of the box, and has an extra cap plate secured by spring bolts. The additional plate fits into catches in the cap, so as to retain all the lubricating material within the box, without the possibility of its escape. A patent for the improvement is applied for, it rendering his patent box more simple and durable, while it retains all the good qualities of the old one.

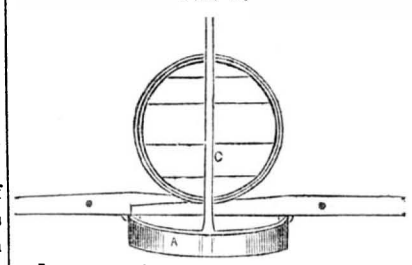
HOUSTON'S SKID SCALE.---Fig. 1.



This is an improvement invented by Mr. Geo. Houston, of Washington, N. C., and for which letters patent were granted on the 13th of August last. Figure 1 is a perspective view (with the scale somewhat fore-shortened.) Figure 2 is a transverse re-action, showing the end of a barrel, I, on the scale. The same letters refer to like parts.

A A are the bed bars, made of iron ½ by 1½ inches; they are set 11½ inches apart for the distance of two feet. B B are the ends, which are gradually brought together and welded to the suspending parts, C C, which are made about 40 inches in the clear. In the centre of the arch above there is an eye, D, to attach the scale to the weigh beam. E is a screw eye bolt, secured by a nut, F, in the frame; this screw bolt can elevate and depress the scale. In figure 1 there are two pair of skids inclined to roll up barrels and heavy bales into the scales; these skids are attached to the scales. In fig. 2 the skids are shown laying horizontally, with a barrel in the act of weighing.

Fig. 2.



It is scarcely necessary to say any more about this valuable improvement, only to remark that the skids are secured to the scale to play freely on bolts, and there is not one who can overlook the convenience of such an arrangement. The skids are well made, of oak, covered with hoop iron, and are braced together by roll braces. In weighing, the barrel is rolled quickly up on one set of the skids till it passes the skid axis, and then its weight depresses the short ends to the bed irons, and lifts the long ends from the ground, thus forming a bed for the barrel, as seen in fig. 2. To romove the barrel from the scale, it is only necessary for the weigher to depress either pair of the skids with his foot, and the barrel will roll down.

These scales can be made of any size to weigh moderate and very heavy articles. The inventor has one in use, which has weighed 100,000 barrels of naval stores, and it is just as good as when first made, and has not cost one cent for repairs. It has been admired by every one who has seen it.

The difference between this improved system of weighing and the old way, is palpable to every body, and its superiority, without a single word being said about it, is self-evident.

We hope this Skid Scale of Mr. Houston will soon be extensively introduced, for assuredly the benefits which it will confer upon all those who use weighing machines—the saving which it is calculated to effect, by the rapidity and ease with which work can be accomplished by it, are all objects which should arrest public attention.

Knapp's Patent Cow Milker.

This is the instrument that almost everybody has heard of, which makes the cows milk themselves; the benefits of such an invention are of no small moment. As a matter of interest to our readers, we present to them these engravings to let them know what the instrument really is, and what it is like.

Fig. 1. Fig. 2.

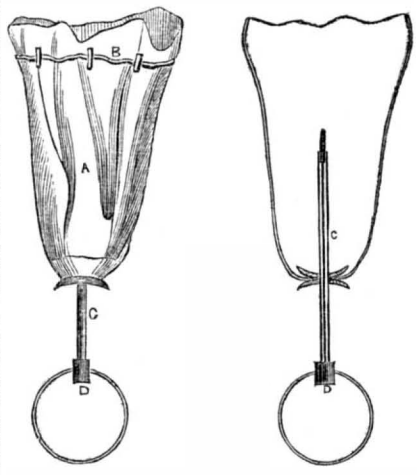


Fig. 1 is an outside view, showing the instrument as applied to the teat, and fig. 2 is an inside view; A is a small india rubber bag, and B is a contracting elastic string to close its mouth, like an india rubber purse; C is a small silver tube which is inserted air-tight in the bottom of the bag A. D is a small rod and piston like that of a syringe, which runs up into the small silver tube. This rod has a ring on its outer end to operate it. The way to use it is as follows:—Open the mouth of the bag A, and fold it back so as to expose the whole of the upper portion of the silver cup.

Take the lower portion of the piston and the ring between the thumb and forefinger of the right hand, holding it firmly.

Take the teat of the cow in the left hand, and squirt it to see the press a little milk out, just sufficient to expand the orifice of the milk passage, then slip the tube into the teat as far as it will go, and with both hands, stretch the sack up over the teat as high as it will extend. This will hold the tube firmly in the teat.

When the instruments are thus applied to all the teats, place the pail under the bag of the cow, then take hold of the lower portion of the tube, close to the teat, with one hand, holding it up firmly; and, with the other, take hold of the lower end of the piston, just where the ring passes through it, and withdraw it; when this is withdrawn the milk will flow in a forcible stream from the teat at once.

In a short time the cow will be milked clean, and as soon as the milk begins to cease flowing, or as soon as it begins to drop from either teat, the instrument should be removed in the following manner: with one hand take hold of the lower part of the instrument, and with the other grasp the teat about midway of the sack, and withdraw the instrument, carefully pressing the last drops of milk from the teat through the instrument, as it is being removed.

It will will be observed that four of these are required to milk a cow—one for each teat.

The following is the inventor's claim, secured to him by patent:

What I claim is the sack made of any suitable material (gutta percha is preferable, however) in combination with the elastic strap for compressing the teat, and neck of sack and the exhauster tube and piston, in form and manner, and for the purpose herein substantially set forth.

Porcelain.

Porcelain is said to have been made in China long before the Christian era, and with every show of truth. There are historical notices of it from the 5th to the 10th century. Marco Polo, the Venetian who visited China, mentions the manufacture of porcelain, and describes the process. This was in the 13th century. Mr. Marryatt refers to an Arabic manuscript in the French National Library, in which, among the articles of a splendid present sent to Noureddin by Saladin, soon after he became master of Egypt, mention is made of a service of China ware of forty pieces; this occurrence took place A. D. 1171. He also refers to a present of porcelain in 1487 from the Soldan to Lorenzo de Medici; and to another notice of nearly the same date, namely, 1475, when a Venetian ambassador at the Court of Persia gave information to his Government respecting it. It does not appear to be quite clear whether the material which in the 14th century we find mentioned in inventories of the effects of the French Royal family, under the term porcelain, be Oriental or Italian; for example A. D. 1370 :—"Item, un pot a eau de pierre de *porcelaine*, a un couvercle d'argent et borde d'argent dore, pesant j. marc, iiij. ounces, xvij. estellins, prisie xiiij. fr. d' or."—"Ung petit tableau de *pourcelaine* ou est intaille un crucifiement sans garnyson," A. D. 1399. The earliest mention of this Oriental ware in England which has hitherto been noticed, is in the year 1586, when among the minor valuables belonging to Mary Queen of Scots, are to be found "Deux cuillieres de *pourcelaines*, garnyes, l'une d'or, et l'autre d'argent." In the following year Queen Elizabeth was presented with "one cup of grene *pursselyne* the foote, shanke, and cover, silver guilte, chased like droppes."—"Item, one porrynger of white *porselyn*, garnished with golde, the cover of golde, with a lyon on the top thereof."

The Voltaic Battery.

A series of articles,—practical articles—is commenced this week about Electricity, &c. The art of electrotyping will be fully explained. They are from the pen of a thorough practical man—one well versed in art and science. To many they will be of great benefit.

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Scientific American

NEW YOR K, SEPTEMBER 21, 1850.

The Power of Lightning, Steam, and the Press.

The power of the press of steam, and the power of a free press are two mighty engines for spreading and advancing civilization. Yoked to steam, newspapers and periodicals are chariots loaded with information, which convey to hamlet and hall the news of passing events, and the deductions of powerful and reflecting minds; and these, like the strokes of the well-tempered steel on flinty stones, elicit dazzling sparks, and kindle up ten thousand fires, which otherwise would have remained nothing more than cold and torpid masses of humanity. Since the invention of printing, discovery after discovery has succeeded one another so rapidly, that it is impossible to present the shadows of their outlines—we will not attempt it. And since steam and printing were united together, unobserving must that man be, who cannot perceive an increased and vivid activity in the general human mind. To-day an important event has occurred some thousands of miles distant (once far away), and within a few minutes after the occurrence, it is fleeting on the lightning's wing, over the attenuated wires of the telegraph,—soon the flying fingers of the compositor arranges it for the printer, and anon ten thousand copies, in one hour, are off and away on the back of the iron horse, to spread before the eyes of ten thousand readers a knowledge of the important event. Are not such things effectual in increasing the mental activity of all *the readers?* Yes, they are; and assuredly those who patronize the press, receive a ten-fold benefit themselves, and always rank above their fellows in respect to that particular kind of information they receive—by the kind of paper they patronize. It cannot be otherwise; and those who read scientific papers—and the more often they read them the better—will assuredly be the best posted up in reference to the advancement of science and discovery. The increase of mental activity in the world of invention, seems to strike no little amount of stupidity out of a number of foggy periodicals themselves. They wonder why so many new discoveries and inventions are bursting so rapidly upon the world; they have not the *gumption* (but they will soon have it) to perceive the general increase of mental activity, hence they are somewhat skeptical, and indulge in not a little of that lowest kind of talent—"low wit"—when they speak upon such subjects. Seven years ago there was only one line of telegraph in America; and it is scarcely as many years more, since Daguerre first seized the solar beam for his pencil, and immortalized himself as limner of the sun.

What the future may realize in discovery, no one can tell, but, if the past is any guide, we may well say, "grand things are yet in nature's hidden treasury, to be revealed for the benefit of man."

The Late State Fair.

It is with no small amount of regret that we must give a condemnatory opinion respecting the preponderance of evil over the good at the late State Fair held in Albany. The amount of drinking and gambling carried on around it, was fearful to behold, and to those who were not eye witnesses of it, incredible. Those who conducted the Fair—the officers of the State Agricultural Society, may not be to blame altogether, but certainly if they had remonstrated with the Mayor of Albany, he is not the man who would stand on the fence—he would at once be, or not be for allowing such things.

The provisions made for the display of articles and stock, such as the tents, and the ground on which they were placed, were any thing but good—in fact nothing could be planned with a better purpose of incompetency. The tents could not protect, nor contain all the articles; and the ground was so muddy in "Manufacturers' Hall" that it was impossible to examine the articles without navigating around in a mud scow.

The good accomplished by Fairs of this kind lies not in the Reports of Committees, nor the prizes awarded—these are often wrong in every sense, owing to the want of qualifications in the men composing said committees and their inability to judge correctly. The good they do is the spirit of emulation excited in the rival exhibitors. If one sees he is surpassed this year, he is excited to do better the next, and this is the way to improve.

The grand and true nucleus of improvement is a minor society, viz., our County Agricultural Societies. No county should be without one; at these Fairs there is a better opportunity of seeing all things and comparing one with another, to decide upon their merits. There is also less sea room for sham and re-display of old stagers. In America, the farming, mechanical and manufacturing interests are so blended together, that they cannot and never should be separated at any Fair. Our State Agricultural Society is right in embracing such a large class of objects for exhibition, although it is morally impossible to give a report about their nature, mode of operation, &c. The reports of the Worcester (Mass.) Mechanics' Association, are the best that we have ever seen relating to the construction of the machines exhibited—their mode of action, &c. Such reports do much good.

The articles set down at the State Fair as designed for the London Exhibition, were few and far between: we had the pleasure of seeing one article only—it was a California gold mounted harness, by Mr. A. Loyd, of Albany; it is worthy of a place in any exhibition.

As our main object to the Fair was to see the articles intended for the World's Fair, we must say, if the State Fair of New York is any test of the amount of American products to be exhibited there, the amount of space devoted to America will be amply sufficient, and the opinions expressed by Mr. Johnstone, at the New Haven Convention, and published in last week's Scientific American, will be found to be incorrect.

Our old acquaintance, Mr. William Hovey, of Worcester, Massachusetts, was awarded two premiums at the State Fair. One, the first prize of a silver medal, for his patent cylinder with adjustable knives attached to wings, cast on the cylinder, by means of binding screws and nuts, with set screws to set the knives out as they might wear away, or require grinding; and the other premium for the best straw cutter. Mr. Hovey's cylinder, with adjustable spiral knives, was illustrated in Volume 4, Scientific American. It is perhaps a matter of astonishment to not a few, how so many premiums have been awarded for machines which have appeared in our columns, but the fact is, those who desire to let the merits of their machines be fully known—who are not afraid of exhibiting them before the public, will come to the Scientific American as having the greatest circulation, to do so, and thus let the public judge of their merits.

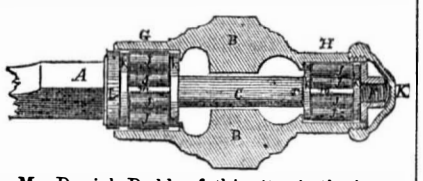
Our New Volume.

This number is the first of Volume 6 of the Scientific American. We don't intend to say much about it at this time, as these things look too much like self-adulation, and we know, besides, that our readers don't like long articles, unless they contain some very important information for them. Well, this does, but it will not be long. We beg simply to say to our new subscribers, and especially to our old friends, of whom we have a great many: You may depend upon it, that this Volume will be the best we have ever presented—the best of the kind in the world; and to your friends who have a taste for useful information, you may recommend it as something they should subscribe for early. Will subscribers at post offices endeavor to get one partner each, for, as a general thing, the papers are not liable to get overlooked or mis-sent, in that case, in the Post Office.

Singular Process.

Under this head, the Sunday Dispatch attempts to be very witty about a receipt in the Scientific American, for making ink, alluding to an ounce of gum mucilage "dissolving one ounce of water," and it wants to know how "one ounce of water can be dissolved." Overlooking a copied blunder, we will ask, whether would it be more correct to say, "dissolving one ounce of water" or "one ounce of gum?" If the latter, then it must be owing to its specific gravity; and if this is the case, in speaking of oil, we must say "dissolving the water in the oil, not the oil in the water." We are perfectly satisfied to take it in either sense, as long as we understand what it means.

Dodd's Anti-Friction Shaft and Axle Roller Cylinder.



Mr. Daniel Dodd, of this city, is the inventor of the improvement represented by this engraving, and for which he has taken measures to secure a patent. The improvement is easily explained. This figure is a vertical section, showing the whole interior. A is a portion of the inner end of an axle; B B represent the hub of the wheel, C represents the journal of the axle passing through the inside of the hub. K is the box nut screwed up on the outer end, E, of the axle, and L is a washer ring, or shoulder, on the axle inside of the hub; G H represent the two sleeves of the hub, they are both alike; in the inside of these sleeves are chambers, for the anti-friction roller cylinders, through which the journal passes; these are made of two ring plates, *k k*, on each. In these rings are snugly fitted the anti-friction rollers, J J, all around. These rollers do not closely touch the ring plates, but are kept from them at the ends by permanent round bars, *m*. These roller cylinders are complete in themselves and fit on the axle like a ring or collar. The bar, *m*, is a little longer than the rollers, so that however tight these rollers may be screwed up by the nut, K, in the hub, the ends of the said rollers cannot bind against the ends of the ring plate. Another advantage is, that the rollers have two motions, one on their own axis and the other by the rings and rollers travelling round with the wheel on the journal. There is no fear of these rollers getting out of order, and there can be little danger of uneven wear. They are compact and snug, and can be applied either singly or in any number to hubs, journal boxes for shafts, &c. The improvement is a simple but valuable one.

Fair of the American Institute.

The Twenty-third Annual Fair of the American Institute will open at Castle Garden on the first of October. This, we have been informed, is to be the best Fair that ever the Institute has had. There can be no doubt but the Fairs of the American Institute are unequalled by any in our land, for the amount and variety of display in machinery and manufactures. Those who intend to exhibit, should have their articles entered by the 27th or 28th of this month.

Letter and Newspaper Clasps.

Mr. Rockwell, whose bed-clothes clasp was illustrated in our last volume, has applied his invention to paper and letter clasps. It is the best and neatest letter clasp that we have ever seen and cannot but recommend it to those who wish such articles. Mr. Rockwell has now an office at 210 Water street, this city, and his clasps are fast clasping public opinion.

Our List of Patent Claims.

All those inventors who desire to have the claims as they are issued every week from the Patent Office, can only get them by subscribing for the Scientific American. It is the only paper which receives the list, weekly, from the Patent Office.

Notice.

Next week we shall commence and publish brief selections from the proceedings of the late Meeting of the British Scientific Association. There will be more to interest our mechanical friends in this than in the proceedings which we have published about the Meeting at New Haven.

Jenny Lind, the Queen of Song.

For some years Europe had been ringing with the name of the Swedish Nightingale, and the echoes of her fame had reverberated along the hills and dales of our beloved land. Many longed to hear her voice, and wished that she might visit our shores. But who was to propose and consummate an engagement with one who had always received the highest rewards in the wealthy capitals of Europe? This was reserved for Mr. Barnum, who, with an enterprise and liberality peculiar to himself—we say peculiar—formed an equally generous engagement on her part.

Jenny Lind has at last arrived, and Jenny Lind has triumphed. Her first concert was given at Castle Garden, on the evening of the 11th inst., and since that time she has given three more. Many went to hear, somewhat skeptical of her powers having been overrated, but all who have heard her, have not only been delighted, but inspired—entranced. Like the famous Greek musicians at

> "The Royal Feast for Persia won,"
> "She raises mortals to the skies."

No one can describe music, nor portray it in speaking colors; to know its power is to feel its effects.

Her appearance—how shall we describe it? Let us say, to everybody, she is just like "Our Sweet Jenny." It is not our custom to speak of such things in our columns, but this is a case to our heart's liking,—Jenny Lind has so much goodness of heart and so much sweetness of disposition, that it gives us pleasure to speak of her. Who among our readers has not read of the Minstrel King of Israel, who longed for a drink from the well of Bethlehem, and when it was brought unto him, not a drop would he drink, but poured it out an offering to his Maker,—so was it with Jenny Lind. The proceeds of her first concert amounted to ten thousand dollars, as her share, but not a penny would she touch—she devoted it all to charitable institutions. When such a benevolent and superior spirit has come among us, who would not wish to see and hear her?

We have heard Jenny Lind both at her concerts and at a rehearsal, and judging by comparison—the only true way—of her powers with those of the most eminent European singers who have heretofore visited America, we may well say of her, in the words of Dryden—

> "At last divine Cecilia came,
> Inventress of the vocal frame;
> The sweet enthusiast from her sacred store,
> Enlarged the former bounds,
> And added charms to sweetest sounds."

Aspect of Death in Childhood.

Few things appear so very beautiful as a very young child in its shroud. The little innocent face looks so sublimely simple and confiding amongst the cold terrors of death—crimeless, and fearless, that the little mortal has passed alone under the shadow, and explored the mystery of dissolution. There is death in its sublimest and purest image—no hatred, no hypocrisy, no suspicion, no care for the morrow ever darkened that little face; death is come lovingly upon it; there is nothing cruel or harsh in its victory. The yearnings of love, indeed, cannot be stifled, for the prattle, and smiles, and the little world of thoughts that were so delightful, are gone for ever. Awe, too, will overcast us in its presence, for we are looking on death; but we do not fear for the lonely voyager—for the child has gone, simple and trusting, into the presence of its all-wise Father; and of such, we know, is the Kingdom of Heaven.

Maryland Mechanics Institute.

The exhibition of the Maryland Institute for the Promotion of the Mechanic Arts will take place on the 14th of next month. Professor Campbell Morfit, Philadelphia, will deliver the opening address.

We are glad to see the name of Mr. Morfit set forth as the person who is to deliver the address. He has earned for himself a good name in "Chemistry Applied to the Arts."

The receipts of the State Fair were $10,456 61: about $2,000 more than on any previous year. $6,077 were taken for tickets at one shilling each.

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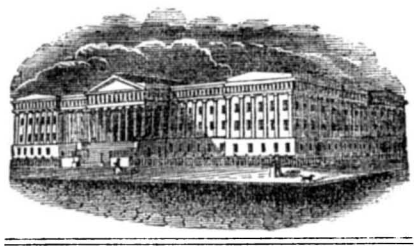

☞Reported expressly for the Scientific American, from the Patent Office Records.

LIST OF PATENT CLAIMS

Issued from the United States Patent Office.

FOR THE WEEK ENDING SEPTEMBER 10, 1850.

To Louisa Balis, of Oriskany, N. Y., for improvement in Ladies' Stays.

I claim the peculiar arrangement (in the body of the stay) of the whale bones, in combination with the gores, of the peculiar form, and in the particular position represented, whereby the usual irritating effects of ladies' garments upon the muscles, &c., about the loins, are avoided, at the same time that effectual support is given to the whole waist, by means of the peculiar position and shape of the gores, and then the easy curves given to the whale bones, as set forth.

To W. B. Billings, of Eastport, Me., for improved mode of representing musical scales.

I claim the manner herein described, of representing each and all of the scales used in music, by the combination of the board, the two side bars, the centre piece, and the bars, having letters attached to them to indicate the name of the notes or sounds they represent, or any other combination of parts substantially the same.

To Samuel Colt, of Hartford, Conn., for improvements in revolving chambered Fire-arms.

I claim as an improvement for fire-arms, having a rotating breech with a series of parallel chambers, in combination with the locking holes of rotating chambered breech fire-arms, substantially as herein specified, making grooves leading to each locking hole, substantially in the manner and for the purpose specified, when this is combined with a bolt, independent of the mechanism which rotates the breech, and which bolt enters to lock by a spring, and is withdrawn by its connection with the lock, substantially as described.

And I also claim holding the rotating breech midway, or nearly so, between any two of the chambers to prevent accidental discharges by means of a recess or hole in the hammer, fitting on to a projection of the rotating breech between any two of the chambers, or vice versa, substantially as herein specified.

To W. W. Draper, of Greenfield, Mass., for improvement in Paint Mills.

I claim the broad depressions in the face of the muller, when combined with the discharging grooves (two) in the same, and with the plane surface of the bed, substantially in the manner and for the purpose as herein set forth.

To S. S. Rembert & J. Prescott, of Memphis, Tenn., for improvement in picking cotton from the bowls in the field.

We claim, first, the combination of the whipping cylinder with the picking disks (two,) and the strippers (two,) and also the combination of the whipping cylinder with the picking cylinders (two) and the strippers, substantially in the manner and for the purpose set forth.

Second, we claim the combination of the picking disks and the strippers, with the gathering planes and the cotton receptacles, substantially in the manner and for the purpose as herein set forth.

Third, we claim the combination of the picking cylinders and the strippers, with the gathering planes and the cotton receptacles, substantially in the manner and for the purpose herein set forth.

To Melchi Scott, of Claysville, Pa., for improvement in Smiths' Strikers.

I claim attaching the raising and rebound springs, and the hammer to the same adjustable frame, substantially as herein described, when this is combined with the adjustable attachment, between the hammer and the treadle, whereby the hammer can readily be adjusted to strike a flat blow on iron of different thickness.

To W. C. Shaw, of Philadelphia, Pa., & J. Stalcup, of Wilmington, Del., for improvement in Camp Bedsteads.

We claim first, so arranging the parts of a camp chest that when it is unfolded in a direction parallel with its length it will constitute a bedstead, which may be the width of the inside of the chest, and when unfolded in a direction at right angles with its length it will constitute a bedstead, which may be of the width of the inside of the length of the chest.

And, second, the arrangement by which a part of the front of the chest can be used as a table leaf, and the slides as seats at the table, substantially in the manner and for the purpose set forth.

To George Shield, of Cincinnati, Ohio, for improved exhaust passages for steam cylinders.

I claim the two-fold outlet, from the cylinder into the exhaust valve chamber, which admits the steam above and below, and discharges it between the disks of the exhaust balance valve, and thus facilitates the insertion, withdrawal and adaptation of the exhaust side in the line of its stem or spindle of a balance valve, whose disks are cast in one piece, and are held down to their seats by the stress of steam.

To Smith Spencer, of Angelica, N. Y., for improvement in mortising machines.

What I claim, in combination with a device for giving the chisel a reciprocating motion, is the device for giving it at the same time an oscillating motion, substantially as herein set forth.

To John Shellenberger, of Indianapolis, Ind., for improvement in machines for Scribing Lumber.

I claim the manner of operating the horizontal sliding carriage carrying the cutter blocks, F F, and cutters or scribers, $f f$, and the vertical sliding carriage carrying the cutter blocks F^2 F^2, and cutters or scribers, $f^2 f^2$, in such a manner that they perform the duties in concert, without interfering with each other, by means of the levers, G G, the rods, R R, the levers, S S, the straps, E E, the levers, I J I J, and weights, K K, in combination with the pulleys, C C, the straps, J J, the rods V V, the levers, $K K^2$, and the weights, L L^2, the levers G G, and the pulleys C C, being hung upon the same shaft and operated by the same treadle, substantially in the manner and for the purpose herein described.

To Robert Stadden, of Milton, Pa., for improvement in Clover Hullers.

I claim the continuous wave form of the rubbers of the concave; and I further claim the continuous wave form of the rubbers, if it should be applied to the cylinder instead of the concave.

To J. B. Stoner, of Southampton, Pa., for improvement in Plow Clevises.

I claim, first, forming a plow clevis by means of two arcs of metal of corresponding outward curvatures, having the point of attachment of the draught link to the martingale for their common centre of curvature, in the manner and for the purpose herein set forth.

Second, I also claim, in combination with a fixed horizontal arc, having a slot between bearing edges, the vertical arc having notches on its inner curve, adapted to the bearing edges of the fixed arc, whereby the direction of draught may be varied horizontally or vertically as required.

To J. M. Totten, of Peoria, Ill., for improvement in Friction Rollers.

I claim the friction rollers, each composed of a series of separate sections held together by nuts, or otherwise, on a common spindle, in such manner that the spindle and roller sections usually turn together, but when any obstruction intervenes, to stop the movement of any one section, and thus cause it to grind and flatten the adjacent sections with the spindle, continuing to roll on, and by rubbing against the obstructed one, tend to move it past the obstruction, thereby preventing continued excessive wear on any one portion of its periphery; hence, the irregular wear of any one of the sections will not affect the general roundness of the whole to such a degree as will materially impair the efficacy of the device as an anti-friction roller.

To David Warren, of Gettysburgh, Pa., for improvement in Plow Cleaners.

I claim the combination of the vibrating finger clearer, with the beam and sheath of the plow; said finger clearer being arranged in such a manner in relation to the sheath or throat of the plow, that by the use of the hand of the ploughman, to elevate and depress a lever, a series of straight or curved fingers will be made to vibrate back and forth adjacent to the sheath, and clear away straw, stubble, and other obstructions therefrom, as described and set forth.

To W. W. Allen, of Bordentown, N. J., for improvement in Tailors' Measures.

I claim the use of the slides for laying off the division of the several measures for a coat, in combination with the fashion slides for the purpose and in the manner herein set forth

To Aaron Palmer, of Brockport, N. Y., for improvement in the Seeding Roller of a Seed Planter.

I claim the construction a seeding wheel for a planting machine, by the combination of two parts of the form herein described, in such a manner that by turning one of the said parts within or upon the other, in one direction, the planting receptacles will be reduced in depth and size, and by turning the said part of the seeding wheel in an opposite direction, the planting receptacles will be enlarged in depth and size, substantially as herein set forth.

ADDITIONAL IMPROVEMENTS.

To Bradford Rowe, of Albany, N. Y., for improvement in apparatus for splitting and stretching Leather. Patent dated April 30, 1850.

I claim the improvement of the apparatus for splitting and stretching leather secured to me by Letters Patent in April 1850, by adding thereto an additional apparatus for stretching leather, especially belting, said apparatus consisting of the combination of two rods placed one above the other in juxtaposition, the upper rod maintaining two clamps to hold the leather to be operated on, the one clamp fixed to one end of the rod, the other clamp moveable along the rod; the said rod being separable from the machine with the leather, after the same has been stretched, for the purpose of allowing the repetition of the stretching operations with another similar rod and another piece of leather.

The under rod to be a permanent attachment to the machine, but moveable along its own length, by the wheel work of the machine, or otherwise, so that when the upper rod is temporally secured to it by one end near the fixed clamp, and the other clamp is held in its position, the two clamps may be gradually separated, stretching the leather lying between them, substantially as set forth in the above specification.

[We have seen this machine in operation and can safely say that is has no equal to our knowledge.]

To Amos Stocker, of Ogdensburg, N. Y., for improvement in Tailors' Measures. Patent dated May 28, 1850; improvement added Sept. 3, 1850.

I claim the combination of the socket and rule with the instrument represented, also the socket in the arms as represented; also the manner of connecting two instruments together by bar, as represented, for the purpose of ascertaining the slope of both shoulders at one operation; also the additional width of the lower arm, and the combination of the groove, slide, and rule, with the lower arm, as represented and set forth,

[See engraving in the Sci. Am, of week before last.]

RE-ISSUE.

To Wm. Howe, of Springfield, Mass., for improvement in the manner of constructing the truss frames of bridges, and other structures. Patent dated Aug. 3, 1840.

I claim in the construction of truss frames, the method of uniting the upper and lower stringers without attaching them to the interposed timbers by the combination of the straining blocks, with the timbers interposed for keeping the stringers apart, and the tension rods for drawing them together, substantially as described, whereby the camber can be regulated with facility along the whole or any portion of the truss, as described.

The Submarine Telegraph between France and England.

The great feat of laying a telegraph wire between Dover and Calais is accomplished, and and messages were passing when the Asia left Liverpool, between the coast of old Gaul and the cliff of old Albion, on the wings of the lightning. The accomplish ment of laying the wire was as follows:—A steamer named the Goliah was employed with a crew of about pilots and sailors, thirty men, consisting of I of the House of superintended by Dr. Reid, ton, C. E.; Mr. Commons; Mr. C. J. Wollast, Edwards, and J. Crampton, C. E.; Mr. F. wheels, in the others. Between the paddle drum or centre of the vessel, was a gigantic wheel, nearly fifteen feet long and seven feet diameter, weighing seven tons, and fixed on a strong framework. Upon it was coiled up in careful close convolutions, about thirty miles of telegraphic wire, one-tenth of an inch in diameter, encased in a covering of gutta percha, the thickness of a little finger. The point proposed to be reached, Cape Grinez, the nearest landmark to the English coast, and between Calais and Boulogne, is a distance of 21 miles, so that a surplus of nine miles of wire was held in reserve for the purpose of slackening. Capt. Bullock, of Her Majesty's steamship Widgeon, caused the track of navigation to be marked in as direct a route as possible by placing a series of pilot buoys with flags on the route, beside being prepared to accompany the experimental cruise with his own vessel as a tender. The connecting wires were placed in readiness at the Government pier in the harbor, and likewise at the Cape, where they run up the face of the acclivity, 194 feet above the sea mark. The necessary batteries and manipulators were all on board, but as a gale and rolling sea unexpectedly sprung up, the operation was adjourned until the next morning. Some interesting experiments, however, were made upon a small scale to show the practicability of the plan. A mile of wire was paid out off the deck, from the pier to Shakspeare's Cliff, and the sinking process was proved to be a practicable performance. A communication to the following effect was also sent through twenty-four miles of wire: "Printed by electric telegraph on board the Goliah steamboat." The connection between the 30 miles of telegraphic wire was then made good to 300 yards of the same wire enclosed in a leaden tube on shore, to prevent it being bruised by the shingle on the beach, and to enable the experimenters, as they proceeded out to sea, to send communications on shore. The vessel being fairly under weigh, steamed out at the rate of three or four miles an hour into the open sea in a direct track for Cape Grinez The wire weighed five tons and the cylinder two. The operation of paying out the 30 miles of wire commenced on a signal to the sailors to "Go ahead with the wheel, and pay out the wire," which was continuously streamed out over a roller at the stern of the vessel, the men at every 16th of a mile being busily engaged in riveting on to the wire square leaden clamps or weights of iron 14 lbs. to 24 lbs., and which had the effect of sinking the wire to the bottom of the sea, which, on the English coast, commences at a depth of 30 feet, and goes on varying from that to 100 and 180 feet, which latter, or 30 fathoms, is any where the greatest depth. The whole of the casting out and sinking was accomplished with great precision and success, owing to the favorable state of the day.—Various salutations were kept up hourly during the process of submerging the wire, between the gentlemen on board and Messrs. J. and J. W. Brett, the original promoters of the enterprise. The only conjectured difficulties on the route was at a point in midchannel, called the Ridge, between which and another inequality called the Varne, both well known and dreaded by navigators, there is a deep submarine valley, surrounded by shifting sands, the one being 17 miles in length and the other 12, and in their vortex, not unlike the voracious one of the Goodwin sands, ships encounter danger, loose their anchors, and drift, and trolling nets of fishermen are frequently lost. Over this, however, the wire was successfully submerged below the reach, it is believed, of either ships' anchors, sea animals, or fishing nets. The remainder of the route, though rougher on approaching the coast of France, was accomplished cleverly but slowly.

This is the greatest feat ever performed, of laying telegraph wire under water. It is but a shadow of the good things to come.

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TO CORRESPONDENTS.

"A. C., of Penn."—We have received yours and will give it attention.

"J. W. K. of N. P —Your favor, containing $4, came sa We cannot furnish you with No. 28 Vol. 4, nor send the paper from the Boston office; all the papers are mailed from this office.

"D P C. of N. C."—The price of the book ed is $2,50. It cannot be sent by mail unless you authorize us to take the covers off. Can it not be forwarded by express so as to save the covers? Please answer by return of mail.

"G. C. of Pa."—The locomotive of Mr. Dimpfel noticed in No. 51, obviates the difficulty you refer to. In Vol. 2 we published an apparatus similar in principle to the one you introduce.

"S. H. W., of N. Y."—Nathan Chapin, of Syracuse, has a good improvement in portable cider mills. By communicating with him you would be able to obtain all the information you desire.

"J. C., 3rd, of N. Y."—Your machine would not be an infringement of Blanchard's patent, because it is made on the Rose Lathe principle, which has long been known and used.

"A. C., of Ct."—A model would be required, but not an expensive one. If it fully shows the principle of the invention this is all that is required.

"C. H. S., of La."—Pump augurs can be had of the Ames Manufacturing Company, Chicopee, Mass. The galvanized twisted rods can be had of Geo. B. Morewood & Co., 16 Beaver street, this city. Price we cannot give."

"J. K., of Ohio."—You cannot patent a foreign invention in this country. Patents are granted only to original inventors in this country. Your last question is answered in the affirmative.

"J. P., of Pa."—The best treatise on gas manufacturing with which we are acquainted may be found in Parnel's work on applied chemistry. It is sold by John Wiley, 161 Broadway.

"B. D. S., of Va."—Our Canada agent is arranging the preliminaries in regard to your business. We shall hope to furnish you soon with positive information.

"S. C. E., of N. C."—A reverberatory furnace is that kind in which the flame is drawn back or prevented from rising.

"J. E., of La."—We thank you for that fine list of subscribers. The Sci. Am. will suit them.

"J. B., of S. C."—We cannot advise you to proceed any further in the matter under the circumstances. Shall be prepared to advise with you at any time in regard to new inventions.

"G.G.H., of Pa."—We wrote you in regard to the "frog" one day previous to the receipt of your letter of the 13th. You will see that we took the same views of the subject.

"W. T., of N. Y."—We have been waiting to see you.

"J. D. S., of Ky."—We do not suppose it possible for us to obtain all the numbers you want. We have not in our possession a *single* number of Vols. 1, 2 and 3, although we have made every effort to obtain sets of them complete. If by any chance we can accomodate you it would give us pleasure to do so.

"G. S., of Pa."—We shall endeavor to furnish the information you require. At present the recipe is not in our possession. There is no good work upon the subject.

"O. P. S., of Ohio."—There is no novelty in your device for shelling corn. The same principle is in use. Your roofing appears very good but it would be scarcely strong enough for the purpose. When Mr. Wood calls we will hear what he has to say in regard to your business. We are so hurried at present that we have scarcely time to examine the matters fully.

"A. L.B., of Ct."—Gutta percha can be moulded when soft into any shape, and removed from the wooden or metal mould freely. It is expensive, but is not affected like india rubber with grease. It is a wonderful substance.

"Dr. F. S., of Pa."—The letters cannot now be cut on the blocks; the space is entirely cut away. New engravings must be made or they cannot appear in our columns. It is easy to mark them on with a pen, but not easy to cut them on the block, when there is no surface left for that purpose. The cost of new engravings and the publication will amount to $8.

"L. M. W., of N. Y."—Your request will be attended to as early as possible.

"L. G., of Pa."—Your views are correct, and we hope they may have the desired effect. The attention of the American community ought to be called to the importance of the subject. We have and shall continue to use our influence in correcting such abuses before it is too late to arrest them.

"G. R. P., of Mo."—The Eolian harp derives its name from Æolus, the god of the winds; it consists of a simple box of wood, with four or five strings, two or three feet long, fastenen at each end. These are tuned in unison, so that, when made to vibrate with force, they produce the same tones. But, when suspended in a gentle breeze each string according to the manner of force in which it receives the blast, either sounds as a whole or is divided into several parts.

"S. M., of Ala."—A one horse engine will be sufficiently large to drive the machine. $2 received.

"W. M., of Ohio."—Hoe & Co., 14 Sheriff street this city, manufacture saws of every description and no doubt would be pleased to receive your orders. Your application for a patent has been forwarded to the patent office.

"S. J., of S. C."—Glacier means an accumulation of ice and hardened snow, occuring in valleys and on the slopes of the Alps and other lofty mountains. The word is derived from *glace* which means ice.

"G. G. H., of Ohio."—We do not know of any publication which combines all the essentials referred to in your letter: they either go one way or the other. "Littell's Living Age" is published weekly at $6 per annum, we believe. It embraces first class literature but no politics.

"J. H., of Va,"—We will hand your letter to seme dealer in daguerreotype materials for attention.

"W.M.F., of Pa."—We do not comprehend the meaning of your question. You must state the case in language more plain and distinct or we cannot answer it.

"T.D. D., of Vt."—We do not know of any such job as you wish to undertake. We very seldom hear of such things, as there are plenty of mechanics ready at all times to take them.

"H. J. B. C., of N. C."—We could not obtain the planing irons at any of the tool stores in the city, and were obliged to order them to be made according to the pattern. They will be forwarded as soon as completed.

"P. N. E., of N. C."—The Straw Cutter which you ordered has been forwarded by the brig Suffolk, marked to the care of your agents at Norfolk.

"W. F. G., of Iowa."—There is a strong probability that you can obtain a patent on your arrangement of the gate; a model had better be sent.

"R. E. C., of Miss,"—You may expect to hear from us in regard to your order about the first of October.

"N.H.S., of N.Y."—The method you speak of we think must be entirely new, and we have no doubt a patent could be secured.

J. E. L., of N. Y.; N. J. W., of Mass.; W. M., of O.; J. C., of N. Y.; L. H., of O.; E. S. C., of Mass.; W. A., of Conn., and L. & Z., of N. Y.—

Your specifications and drawings have been forwarded to the Patent Office with models, and the respective fees paid.

Money received on account of Patent Office business, since Sept. 7, 1850 :—

J. H. T., of N. Y. $50; F. C. A., of Ky., $20; D. D., of N. Y., $30; B. F. M., of Vt., $30; J. C., of N. Y., $45; E. S. C., of Mass., $20; J. D. B., of Phila., $20; P. G. E., of N. Y., $52; A. J. S., of Ga., $55, and G. G. H., of Pa., $30.

Important Notice to us!

Whenever any of our friends order numbers they have missed—we shall always send them, if we have them on hand. We make this statement to save much time and trouble, to which we are subjected in replying, when the numbers called for cannot be supplied.

ADVERTISEMENTS.

Terms of Advertising:

One square of 8 lines, 50 cents for each insertion.
" 12 lines, 75 cts., " "
" 16 lines, $1,00 " "

Advertisements should not exceed 16 lines, and cuts cannot be inserted in connection with them for any price.

PROSSER'S PATENT LAP-WELDED Boiler Tubes—Diameter, Number and Length of each at date :—

Inches.	In Stock.			Afloat.
1 1-4	1191	7-0		—
1 1-2	86	10-6		120
1 3-4	—	10-6		290
2	215	10-0		—
2	1052	12-0		721
2	397	14-0		—
2	1201	15-0		700
2	55	4-9		—
2	77	4-10		—
2 1-4	507	15-0		252
2 1-2	454	15-0		210
2 3-4	348	15-0		180
3	58	15-0		200
4	10	15-0		—
5	1	15-0		—
6	14	15-0		—

THOS. PROSSER & SON, Patentees,
September 17, 1850. 28 Platt st., New York.

Patent Office.
128 FULTON ST.

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Scientific Museum.

Coal Ashes as a Manure.

I noticed in No. 50, Vol. 5, of the Scientific American, an article headed "Hard Coal Ashes," which goes strongly against the use of that article as a manure, which, in my opinion, is not well founded, as a general thing, as I know by experience, and also from observation, that it is beneficial on some kinds of soil. In the spring of 1849 I applied 50 bushels of hard coal ashes to a lot of ground 50 by 150 feet, my neighbors telling me at the time that I would burn it up, particularly if it was a dry season, which it proved to be; but instead of burning it up, my trees and vegetables grew most luxuriantly, and at the same time their gardens were mostly dried up. Last spring I planted apricot, peach and other fruit trees in the same lot, some of which have grown shoots from 4 to 5 feet already, and are still growing very fast—one of the peach trees producing ripe fruit of first rate quality. In 1847 I saw hard coal ashes applied to a part of a field of corn, which was at least a third better than that on which there was none used; and again on the first of August I happened to see a large heap of hard coal ashes in my brother's garden, in Reading, Pa., on which there was corn and cucumbers growing as thrifty as I have ever seen them, and that, too, where there was nothing but the ashes. The lots referred to above were of a gravelly nature.

GEORGE W. LEE.

Erchildown, Chester Co., Pa.

[The article to which friend Lee refers states a positive fact, but there might be some other cause of the failure of the crop, than the coal ashes, although none could be adduced. Here, however, we have Mr. Lee's experience, and it is just such experience as we like to publish, because it is useful and can be depended on. As there are hundreds of thousands of tons of coal ashes thrown away every year, we hope that Mr. Lee and others will give us the results of their future experience with them, for this is something which concerns the whole country.

To Harden Steel without Springing.

Let the heat be as uniform as possible, and dip it perpendicularly and slowly into the water, so that it may chill regularly on all sides at the same time, and near the surface of the water. If dipped obliquely, the under side will chill first, and as it contracts will draw the upper side, which is still soft. When chilled in that condition it is thrown out of shape. The same thing often occurs when the steel is plunged suddenly into the water, by a bubble of steam remaining on one side till the other chills; hence the necessity of letting it chill near the surface. The lowest heat at which steel will harden is always the best, as by raising the heat above that point you only open the pores, rendering it more brittle without getting it any harder.

These facts are derived from experience in making small tools, &c., in my business, I am a watchmaker. D. I. WELLS.

[This is good and practical information.

Butternut Sugar.

We see it stated in the American Agriculturist, that the sap of the butternut tree yields a fine sugar, which has a peculiar flavor, something like honey. The tree is tapped and worked like the maple, but it has a tendency to form like a jelly, hence it has to be strained and clarified, when very weak. This tree is tapped, like the maple, in the spring. As in many places there are plenty of butternut and walnut trees, experiments to make this kind of sugar should not be overlooked.

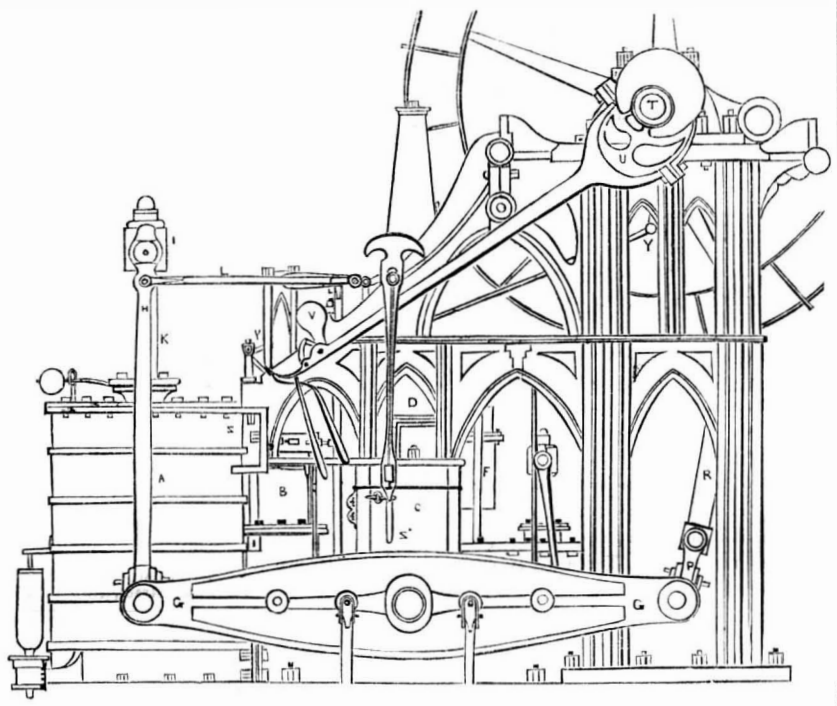
Durability of Iron Ships.

The iron ship John Garrow, which was built in England in 1840, and is the largest afloat, has been since then employed in voyages in foreign climates that have been supposed to be prejudicial to iron vessels. A short time since she was laid up at Liverpool, when several holes were bored in her, and the thickness of her plates tested. By the closest examination no perceptible loss was ascertained. With care, such vessels may last for forty years.

Ocean Navigation--Marine Steam Engine.

The regular navigation of the Atlantic between Britain and America, by Steamships, has been a fixed fact since the 23rd day of April, 1838. On that day the Great Western arrived at New York, from Bristol, in England, after a passage of 15 days. Since that time there has been regular steam communication between Europe and America. Although it is twelve years since the day when the Great Western arrived in New York Bay, yet there are thousands in our country who have never seen a steamship, and who know nothing about the difference between the River and the Marine Engine. We will now explain the difference, to show, as is our object, the manner in which the two are employed to propulsion.

This engraving is a side elevation; A is the cylinder; B the slide valve casing, C the condenser, D the hot well and the air vessels placed on the condenser. The air pump is placed below the feed pump, F. K is the piston rod of the cylinder; I is the cross-head; H is one of the cylinder side rods, which descends to the beam or side lever, G. L is one of the rods of the parallel motion; V is the weigh shaft on which is fixed the valve lever, the other end of which is fixed in the slide valve link. The bilge and brine pumps are set below the beam, and worked by rods attached to it. To the extremity of the beam the links, P, of the cross-tail are attached to the connecting rod, R. T is the paddle wheel shaft: U is the eccentric to work the valve rods; Y is the expansive valve apparatus; Z (turned letter), is the lever for starting the engine. The River Engine is high, and placed on and



above deck, but owing to the difficulty of sea navigation, all the machinery has to be made snug, under cover, and between decks. For this purpose the beam of the marine engine is placed below, down at the bottom of the cylinder, instead of being above it. The beam of the marine engine is of two parts, divided—one plate fixed on a centre on each side at the bottom of the cylinder, and connected together, to act as a single lever, as represented; this is called "the Side Lever Engine," and is the kind employed on the Cunard, British, and the Collin's, American, unrivalled Mail Steamers. It is held to be the best kind of engine for ocean navigation, because the lever is so convenient to work the pumps, and because the whole parts are so snug in their general arrangement.

Owing to the short period since the Atlantic came to be regularly navigated by steam, many have supposed that some grand discovery—some recent invention brought about this desirable event at last. But this is not so; there is not a new principle in one of the newest and best steam ships. The side lever engine has been in use for thirty-two years, and the one above, viz., that of the Britannia, differs but very little from that of the United Kingdom, built by David Napier in 1822. So far as the simple crossing of the Atlantic is concerned, the steamers which have been built on the Clyde for thirty years past, could have done it easily, but not profitably.

To no one living man is the world so much indebted for improvements in marine navigation, as to David Napier, now of London, and cousin to the Engine Builder of the Royal Mail Line. He built the steamer and established the first regular sea communication between different countries,—he was the first who established mail steam communication between Scotland and Ireland and then between England, Ireland and France. The pioneer steamer of deep sea communication was the Rob Roy, a vessel of 90 tons burden, which first ran between Glasgow and Belfast, summer and winter, and it was then sold and used as a packet to run between England and France. It was difficult to persuade the British Government that steamboats could be used for the mail service between Ireland and England; and before they were adopted for this purpose, a commission was appointed by Parliament to take evidence in the case. The whole evidence will be found in Partingdon's work on steam navigation—a dry but truthful book.

From 1818 marine navigation has been gradually extending throughout the world. Before the Atlantic was crossed by the Sirius, in 1838, many steamships had made longer passages; for a number had been built in Britain that had doubled the Cape of Good Hope, on the route to their destination—the East Indies.

It is morally impossible for a small steamboat to make long sea voyages: she cannot have power enough to overcome the continued resistance of the ocean for any length of time. This is the reason why the largest steamships, if well built, and have powerful engines, will be the most successful and make the quickest passages.

Since the Great Western made her first voyage to New York, only twelve years ago, the length of the passage has been shortened at least two days. This has not been owing to any new invention, but to finer built and more powerful vessels being employed.

There are two mail lines of steamers running between America and England,—they appear to be guided by a generous spirit of emulation. The American steam ships are larger than the present British vessels, and they have made very regular and fast passages. The Atlantic and Pacific, belonging to Mr. Collins, are the largest steamships in the mercantile marine in the world. We do not expect too much when we say, that in ten years from the present date, the average passage across the Atlantic will be nine days.

American Mesmerizer in Britain.

Dr. Darling, of New York, has been giving a course of lectures on mesmerism to the people of Glasgow. He made his subjects open their eyes, ears; stand, sit, sleep, laugh, talk—and we don't know what all. He is a darling of an operator.

To Extract the Essential Oil from any Flower

Take any flowers you choose, place a stratum in a clean earthern pot, and over them a stratum of fine salt. Repeat the process till the pot is filled: cover closely, and place in the cellar. Forty days afterward, strain the essence from the whole through a crape by pressure. Put the essence thus expressed in clean bottles, and expose them for six weeks to the rays of the sun and the evening dews, to purify. One drop of this essence will communicate its peculiar and grateful odor to a whole quart of water.

A new and inexhaustible quarry of slate has lately been discovered in Wales; this is a valuable discovery, as the Welsh slate is allowed to be the finest in the world.

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Any person sending us three subscribers will be entitled to a copy of the "History of Propellers and Steam Navigation," re-published in book form—now in press, to be ready about the 1st of October. It will be one of the most complete works upon the subject ever issued, and will contain about ninety engravings

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